

# Ginkoba Ginseng Combination Therapy versus Methylcobalamin on Quality of Life in Chronic Tinnitus

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## ABSTRACT

**Background:** Tinnitus is defined as a perception of a sound without an external acoustic source and is often expressed as a sense of ringing, whistling, roaring or buzzing. In about 25% of the affected population it interferes with daily activity and in approximately, 1% to 3% of them Quality of Life is severely hampered. The aim of the study was to assess the difference in Quality of Life of patients having chronic tinnitus and receiving either ginkgo ginseng combination or methylcobalmine.

**Methods:** A prospective study was done on patients suffering from chronic tinnitus, attending the ENT OPD of Era's Lucknow Medical College for a period of 6 months. A total of 60 patients divided into 2 groups of 30 each. Group I was given 40 mg of ginkgo biloba and 100 mg ginseng combination for 4 weeks and Group II was given methylcobalamine 1500mcg for 4 weeks. A validated and recognized 'TINNITUS INVENTORY SCORE' was used to assess the quality of life.

**Results:** A significant difference was seen in pre-treatment and post-treatment THI scores in patients receiving 40 mg of ginkgo biloba and 100 mg of ginseng combination therapy. There was no statistically significant difference seen in THI scores of patients receiving 1500 mcg of methylcobalamine. **Conclusion:** Results suggest that ginkgo biloba with ginseng combination therapy improve the tinnitus symptoms and mental well being in chronic tinnitus patients.

**Keywords:** Chronic Tinnitus, Ginkgo biloba Ginseng, Methylcobalamine, Tinnitus Handicapped Inventory Score

## INTRODUCTION

The term tinnitus originated from a Latin term, 'tinnire' which means 'to ring'.<sup>[1]</sup> Out of the 7.5 million people in the world, about 15% to 20% of people suffer from tinnitus. In about 25% of the affected population it interferes with daily activity causing severe mental and physical impairments and in approximately, 1% to 3% of them Quality of Life is severely hampered.<sup>[2]</sup> Tinnitus is defined as a perception of a sound without an external acoustic source and is often expressed as a sense of ringing, whistling, roaring or buzzing. Even today the exact pathophysiology of tinnitus is baffled, the most accepted theory for tinnitus is the neurophysiological Model of Jastreboff, that emphasises on the fact that tinnitus is a subcortical perception and results from the processing of weak neural activity in the periphery.

Cochlear function is dependent on the adequate vascular supply and the normal functioning of nerve

tissue. Vitamin B12 deficiency leads to axonal degeneration, demyelination and subsequent apoptotic neuronal death.<sup>[3-5]</sup> And also reduced levels of vitamin B12 are closely related to destruction of the microvasculature of the striavascularis culminating in reduced endocochlear potential, hearing loss and tinnitus.<sup>[6]</sup> Another common cause of tinnitus is inner hair cell damage which is mainly caused by production of reactive oxygen species.

Ginkgo biloba extract is a powerful glutamate antagonist which acts as a potent anti-oxidant within the cochlea, helping to minimise damage caused by free radical buildup.<sup>[7]</sup> Ginseng has many beneficial effects over the human body one amongst those is attenuation of hydrogen peroxide induced oxidative stress, inhibiting reactive oxygen species (ROS) generation, and expression of caspase-3 and poly-ADP-ribose polymerase in cisplatin-induced apoptosis.

The Tinnitus Handicap Inventory 10 is the most recent, reliable, and most widely used of several questionnaires developed over the last 20 years, hence it was selected for quality of life assessment of patient suffering from chronic tinnitus.

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## MATERIALS AND METHODS

It was a prospective study conducted over a 6 months duration on 60 patients visiting the ENT OPD of Era's Lucknow medical college, Era University, India, with the complaint of chronic tinnitus ( $>6$  months).

### Patients were excluded on the basis of criteria decided by the authors, that is:

- Patients suffering from any otological disease except hearing loss and tinnitus.
- Patients suffering from congenital anomalies leading to otological problems
- Patients with any otologic infective pathology and middle ear pathology.
- Patients on Ototoxic drugs.
- Patients who have undergone ear surgery or having tinnitus after head injury or any other organic illness in head and neck region

The study was approved by the local committee of the university and is carried out in accordance with the declaration with the Helsinki as amended in 2013. All the patients included in the study underwent complete ENT examination including pure tone audiometry, impedance audiometry and were assessed on the basis of Tinnitus Handicapped Inventory. The patients were randomly divided into two groups, Group I patients were prescribed Gingko biloba with Ginseng combination therapy for 1 month and Group II patients were given Methylcobalmine therapy for 1 month duration. All the patients were re-assessed after 1 month where they were asked to fill the Tinnitus Handicapped Inventory again.

The pre-treatment and post treatment scores were further analysed.

## RESULTS

The data was analyzed using SPSS 21.0 software. Independent sample 't'-test, Chi-square test and paired 't'-test were used to compare the data.

Out of 60 patients who were eligible for the study, males were found to be 33(55%) and females were 27(45%) [Figure 1], with an average age of presentation in Group I being  $36.43 \pm 12.52$  and in Group II being  $37.90 \pm 12.4$  [Table 1].

It was found that the pre-treatment THI score of patients receiving ginkgo biloba with ginseng combination therapy was  $27 \pm 15.72$  and in patients receiving methylcobalmin therapy was  $23.40 \pm 12.86$

[Table 2]. The post treatment THI scores of patients receiving ginkgo biloba and ginseng therapy was  $13.20 \pm 8.56$  and for patients receiving methylcobalamin therapy was  $14.27 \pm 8.38$  [Table 2]. Upon intergroup comparison of pre-treatment THI scores, where the mean score for Group I was  $27 \pm 15.72$  and Group II was  $23.40 \pm 12.86$  [Table 2], it was observed that the difference was not statistically significant. On intergroup comparison of post treatment THI Scores, Group I mean value was  $13.20 \pm 8.56$  and Group II mean value was  $14.27 \pm 8.38$  [Table 2], this difference was also not found to be statistically significant.

The intragroup comparison for Group 1 patients, where the pre-treatment mean THI scores were  $27.00 \pm 15.72$  and post treatment mean THI scores were  $13.20 \pm 8.56$  [Table 2], a decrease in the THI scores was noticed. After data analysis this difference was also found to be highly statistically significant. Intragroup comparison of Group II patients, where the pre-treatment mean THI scores were  $23.40 \pm 12.86$  and post treatment THI scores were  $14.27 \pm 8.38$  [Table 2], it was that there was a decrease in the pre and post treatment THI scores, which was also found to be highly statistically significant.

A reduction in THI scores was observed in patients of both the groups before and after treatment and this decrease was more in patients prescribed ginkgo biloba with ginseng therapy for a period of 1 month. The decrease was also found to be highly statistically significant for both ginkgo biloba with ginseng combination therapy ( $p < 0.001$ ) and with methylcobalmin therapy ( $p < 0.001$ ) [Table 2]. Upon comparing the two treatment modalities, it was also noted that treatment with Ginkgo biloba with ginseng combination therapy ( $t = 7.550$ ) is better than methylcobalmine therapy ( $t = 5.022$ ) [Table 2] observed over a period of 4 weeks.

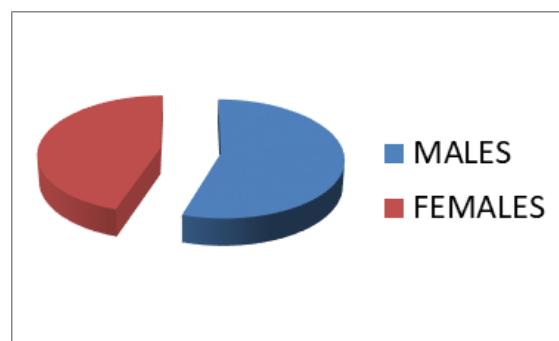


Figure 1: Gender distribution in the study(Males=33, Females=27)

Table 1: Comparison of Demographic Profile

SN	Characteristic	Group I (n=30)		Group II (n=30)		Statistical significance (Independent samples 't'-test)	
		Mean	SD	Mean	SD	't'	'p'
1	Age	36.43	12.52	37.90	12.41	-0.456	0.650
2	Sex	19 (63.3%)	11 (36.7%)	14 (46.7%)	16 (53.3%)	$\chi^2 = 1.684$ ; $p = 0.194\#$	

**Table 2: Comparison of pre- and post-treatment Quality of life between two study groups**

SN	Characteristic	Group I (n=30)		Group II (n=30)		Statistical significance (Independent samples 't'-test)	
		Mean	SD	Mean	SD	't'	'p'
1	PRE TREATMENT THI SCORE	27.00	15.72	23.40	12.86	0.971	0.336
2	POST TREATMENT THI SCORE	13.20	8.56	14.27	8.38	-0.488	0.628
Extent and significance of change in THI scores following treatment (Paired 't'-test)		Mean change $\pm$ SD = -13.80 $\pm$ 10.01 't'=7.550; p<0.001		Mean change $\pm$ SD = -9.13 $\pm$ 9.96 't'=5.022; p<0.001			

## DISCUSSION

Most of the authors consider the origin of tinnitus as cochlear (lesions of the ciliated cells of the inner ear after acoustic trauma, presbyacusis, sudden hearing loss, etc.) and many patients suffer from hearing loss not subjectively felt. The central processes, especially anxiety, exacerbate the discomfort and whether or not the tinnitus is disturbing, is determined through further central auditory processing of the tinnitus "signal" and its psychological validation.

The 10% of the adult population is afflicted by tinnitus and in many cases consequential changes in quality of life and substantial modifications of behaviour, including anxiety, irritability, depression and sleep disturbances are reported.

The failure of many treatments and drugs in particular, has led several teams to propose treatments based on different concepts. There are a number of reports in the literature suggesting that Ginkgo biloba with ginseng combination and methylcobalamin therapy may be effective in the management of tinnitus thus we have conducted a study to assess the difference in Quality of Life of patients having chronic tinnitus.

The Tinnitus Handicap Inventory is a reliable, and most widely used of several questionnaires developed over the last 20 years, consisting of 25 questions and having a total sum of 100 points. Craig W. Newman<sup>[10]</sup>, with two other researchers developed the Tinnitus Handicap Inventory in 1996 and it is the default questionnaire used to this day. It consists of 25 questions divided into 3 subgroups: functional, emotional and catastrophic. Eleven items are included in the functional scale, 9 in the emotional scale and 5 in the catastrophic scale.

Tinnitus has been found to affect men more than women which coincide with our study, where males were 33(55%), females were 27(45%). Kim TS et al,<sup>[8]</sup> conducted a study on the Effect of Korean Red Ginseng on symptoms and Quality of Life in Chronic Tinnitus, a Randomised, Open-Label Pilot study on 61 patients with chronic tinnitus. 59 patients completed the protocol out of which significant improvement was seen between initial and post treatment THI scores in patients receiving 3000 mg/day ginseng extract.

In our study, there was a decline in the THI scores pre and post treatment with ginkgo biloba and

ginseng combination and this difference was also statistically significant. Singh C et al,<sup>[9]</sup> conducted a study on therapeutic role of vitamin B12 in patients of chronic tinnitus on 40 patients. Improvement in mean tinnitus severity index score and visual analogue scale was seen in patients receiving vitamin B12.

In our study, there was a decline in the THI scores pre and post treatment with both ginkgo biloba ginseng combination therapy and methylcobalamin, the decrease was found to be more with ginkgo biloba and ginseng combination therapy.

## CONCLUSION

A significant decrease was noted in THI scores when given treatment with both Ginkgo biloba with ginseng combination and methylcobalamin therapy. However, on comparing the two treatment modalities no statistically significant difference was seen between them.

As this is a new addition in the spectra of medical management of chronic tinnitus we suggest the need for more studies to be conducted with larger cohort as well as including a control arm to reach a definite conclusion.

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